

Commissioner Musgrave,

In response to your invitation to submit closing thoughts for your final consideration, I submit the following.

1. **IAAO Recognition of Chi-Square Test.** There was discussion today of whether the IAAO has recognized the Chi-Square test. It has. On pages 299-300 of the Mass Appraisal of Real Property, the Chi-square test is mentioned as test for equality of assessment between groups of property (i.e. sales chasing) as long as the expected count for each cell exceeds 5, which it does by far in all of the cases we cited.
2. **The of lack of homogeneity in Michigan Township.** While Dr. Kelly's April 16 presentation mentioned that residential properties were vastly dissimilar in Michigan Township. While we do not concur with Dr. Kelly's assertions about the impact of non-homogeneity on the Mann-Whitney test, Dr. Kelly didn't make such a representation about commercial properties. Mr. Denne has performed a sales ratio study on those commercial properties and the Mann-Whitney test shows statistically significant findings of sales chasing. Dr. Schwab could easily replicate the test.
3. **The Sensitivity of the Mann-Whitney¹ test, the lack of importance of differences in medians, and certain townships not being found in violation of sales chasing.** Nexus has pointed out that in some instances the median level of assessment between the sold and unsold properties does not deviate by too much. (See, e.g. page 4. of the April 16 Nexus handout, "Further please review the median % change figures by neighborhood for Michigan TWP. Virtually all neighborhoods have very similar changes.") Nexus argues that because the medians are close, sales chasing could not have taken place. But as Mr. Denne explained, sales chasing can be positively shown even when the median of sold properties does not differ at all from the median for sold properties. Simply put, the Mann-Whitney test is much more important in detecting sales chasing than comparing differences, or lack of difference in the medians of sold and unsold properties. If the Mann-Whitney was not a more meaningful tool, why would the IAAO even recommend performing the Mann-Whitney?

The explanation of why the Mann-Whitney is the touchstone for testing for sales chasing, and comparing medians is not starts with the sensitivity of the Mann-Whitney test. The Mann-Whitney test is not particularly sensitive; quite a bit of sales chasing can take place before the test will reveal sales chasing to a statistically significant degree. Overall, that's a good thing; we don't want the test to reveal a lot of false positives and find sales chasing where it does not exist. There is a concomitant downside: the lack of sensitivity also means that some "modest" sales chasing can take place without being detected by Mann-Whitney.

Sales chasing will affect the COD more readily than the median level. COD's are the average percentage deviation from the median ratio. The median levels is just what its name implies. One of the strengths of the median is that it is resistant to the pull of outliers, while averages are more subject to the influence of outliers. Therefore, it may take quite a bit of sales chasing to move the median level, because changing a few bad assessments won't move the median much. COD's are another matter and, as averages, can be moved a great deal by only a few changes. Therefore, an assessor who needs to bring his or her COD's into tolerance, may not need to move many assessments (chase many sales.) As Mr. Denne has indicated, and a little experimenting with sales ratio data will demonstrate, it is quite possible to bring COD's into tolerance and not move the median level at all. (Obviously, the smaller the sample, the fewer sales that would need to be changed to move the COD.) In fact, the Nexus April 16 memo

¹ Dr. Kelly invariably refers to "the Wilcoxon (sic) Mann-Whitney test. For the sake of clarity, this is the same test that Mr. Denne and the IAAO refer to as the Mann-Whitney test. The correct spelling, however, is "Wilcoxon," not "Wilcoxon."

contains examples of how removing just one or two sales may be enough to bring non-compliant COD's into line.

With regard to the fact that not every township failed the Mann-Whitney test, one could conclude either that sales chasing did not occur, or alternatively, that the Mann-Whitney test just wasn't sensitive enough to detect a "modest amount" of sales chasing.

4. The Law and Good Assessment Practices. It is always a pleasure to discuss the law with an economist. In his email of this evening, Dr. Kelly sites 3 Indiana Tax Court cases.² The cases stand for the proposition, as we discussed this afternoon, that in order to overturn an assessment on appeal a taxpayer cannot simply rely on an error in the assessment, but must provide substantive evidence of the correct value of the property. For example, in *Ekerling v. Wayne Township Assessor*, the Ekerlings could not just point to the fact that the assessor used the wrong schedule to cost out their improvements. In order to win on appeal, the taxpayer had to show independent evidence of the market value in use of their property. Thus, the fact that the assessor may have used the wrong cost schedule was not enough by itself for the taxpayer to prevail. But that is a far cry from saying that in setting the assessment the assessor is free to use whatever cost schedule suits his whim, as long as the ultimate value is correct. Importantly, neither the Tax Court nor the IBTR has ever said that assessors may change fundamental property characteristics—including age, grade and condition -- without regard for the actual physical characteristics of the property.

The "disconnect of information" is in not being able to perceive the difference from carrying a burden of proof in an assessment appeal, and what constitutes good assessment practice. It is true that Indiana, like most other states, initially sets assessments based on the cost approach. It is also true that in Indiana, like most other states, if the assessor does not believe that the cost approach is an accurate reflection of value, he or she should make adjustments so that the assessed value is correct. But that does not mean, as Dr. Kelly surprisingly alleges in his email, **"that the final assessed value is the only important element of the assessment, not grade, condition or other elements."**

Indiana's assessment system starts with the physical attributes of property and estimates the cost to construct those improvement. (Replacement Cost New, or RCN). The next step in the system is to depreciate the RCN based on factors such as age, grade and condition. Finally the assessor adds in land value. If assessments set under the cost approach are to have any hope of accuracy and uniformity, it is imperative that the physical characteristics, age grade and condition, and land values be established by the assessor as accurately and honestly as possible. If at the end of that calculation the indicated value needs to be adjusted, the assessor has the authority to do so. He or she does not have the authority to change factors that have been correctly entered. Dr. Kelly, however explained in his April 16 presentation, that in some neighborhoods, Nexus adjusts one or more factors such as age, grade or condition, in order to arrive at what Nexus believes is the correct market value in use. In other cases they use different factors. On April 16, Dr. Kelly said that it doesn't matter what factor you change, as long as the bottom line is correct.

It does matter. In setting assessments it matters a great deal. It matters because an assessor must have an accurate inventory of property characteristics if there is to be any hope of correctly estimating replacement cost. It matters because if there is to be any uniformity between assessments we must be able to have a true understanding of not only the market values of properties but also their physical characteristics. It matters because accurate trending requires accurate physical information about the properties that are to be trended. It matters because as

² The BKKM case cited by Dr. Kelly is an unpublished decision which, according to Indiana Court Rules should not be cited as authority.

an assessor attempts to model the market, he or she must know and consider the actual physical characteristics of properties.

And it matters to the integrity of the system. It matters to the public's trust in the system. Is it any wonder that so many citizens of LaPorte County have lost all faith in the assessment system when their assessor says that grade, condition, age and "other elements" are not important? If assessors treat land values – an essential part of the every assessment – as just an arbitrary, "back-filled" number to be inserted in order to keep the taxpayers from knowing why their assessments are actually being increased, the system is diminished.

Dr. Kelly has mis-quoted the Manual in a futile attempt to support his position that "the final assessed value is the only important element of the assessment, not grade condition or other elements." Dr. Kelly states, "[i]n fact page 2 of the Manual states in part that **assessors shall make whatever changes necessary to arrive at their view of the proper value.**" (Emphasis added.) The manual says no such thing. Presumably, Dr. Kelly refers to this quote that appears on page 2 of the Manual.

Although this assessment manual provides general rules for assessing property, situations may arise that are not explained or that result in assessments that may be inconsistent with this definition. In those cases the assessor shall be expected to adjust the assessment to comply with this definition and may ask the State Board to consider additional factors, pursuant to IC 6-1.1-31-5, to accomplish the adjustment.

Therefore, nothing in the manual suggests that Assessors are encouraged to make incorrect changes to grade, condition, effective age, or any other property characteristic. What IS required is that they adjust the assessment to make the "bottom line value" reflect the market value in use. There is an express column in property record cards that permits assessors to make a "market adjustment" to comply with the definition of value. Making such adjustment not only complies with the intent of the Manual, but it preserves physical characteristics of the property data in a way that permits assessors to trend assessments in future years.

5. **The Mann-Whitney test is valid, even if the sales chasing has taken place over more than one year.** No authority has been cited, and none exists for the assertion that there is any relevance to the period of time between reassessments in applying the Mann-Whitney (or any other) sales-chasing test.